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Tuberculin as a Diagnostic Agent for Bovine Tuberculosis*

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I must first of all express my thanks to the Division for asking me to present a paper on such an important subject. It will not be possible for me to cover all the many ramifications of tuberculin testing for the diagnosis of bovine tuberculosis in cattle in the short time at my disposal, but I shall endeavour to submit to you an outline of the position as I see it in the hope that essential omissions may be rectified and the more important points emphasised in the discussion. May I also say, now, that I feel very humble in speaking on this subject in the South Wales Division where tuberculin testing forms such an extensive part of the daily round and the common task.

It is many years since tuberculin was first used as a diagnostic for tuberculosis in cattle and we have, all of us, seen changes in the methods of testing and in the outlook to the test. For instance, we have seen the change from the much maligned subcutaneous test to the double intradermal test; so that now, when we mention the tuberculin test we almost invariably mean the double intradermal test. We have seen changes in the tuberculins which have been used for diagnosis, and we have most of us taken an active part in the work in the field, work which must be associated with the efforts of our colleagues engaged in research if we are to find the most reliable test which may be used to diagnose bovine tuberculosis in cattle.

While we all realise that although, in spite of the difficulties associated with testing at an earlier day, herds which were cleared of tuberculosis by the use of the subcutaneous test have remained free and similarly herds tested and cleared by the double intradermal test using earlier tuberculins have also remained free, that is no reason why we should be content with methods and tuberculins which fall far short of our aim.

There is no need to dwell on the tests which have been used in the past. The subcutaneous test had its day and had very obvious limitations but was still a useful test when properly applied. The ophthalmic test was used fairly commonly but mainly as an adjunct to the subcutaneous and those of us who have used it know that for that particular purpose it was often of considerable value. The intradermal palpebral and the subpalpebral tests (which in practice are synonymous) were used mainly as check tests and claims of accuracy and simplicity were advanced for them by many who had experience of their use. The single intradermal test has been used, though not extensively in this country, and has been applied in the neck, the caudal fold and the vulva. Now we have the double intradermal test as the recognised test for all official purposes and almost universally adopted for testing in this country.

What have been the difficulties with the tests mentioned? The greatest difficulty has always been to decide what is a positive reaction. In the intradermal tests the criteria have been swelling at the site of the injection, presence of oedema, pain and heat; and perhaps more heat has centred round the discussions on the question than was ever found in the vast majority of positive reactions. Measurement of the swelling is certainly the best method of recording the result and a description of the swelling helps to allow one to visualise the reaction to some extent, after nothing remains for examination but the record of the test. But there is no doubt that the yard stick upon which we measure reaction in the intradermal test is not a good one because there is room for opinion in the description of the reaction and actual measurements are not always taken with sufficient care. (I will revert to this later when discussing the comparative test.) This fault in the intradermal tests has led to unfavourable comparison with the subcutaneous test where the temperature chart was regarded as a good indication and provided a permanent record of the result of the test. So it was, properly assessed. For instance, it has been variously stated that a rise of temperature of 2° constitutes a reaction or that a rise to a temperature of 104° constitutes a positive reaction while a rise to between 103° and 104° must be classified as doubtful. It would probably be more correct to say that a rise of temperature above 104° or a gradual progressive rise of temperature until the 18th or 21st hour after injection is a positive reaction. For example, here are three reactions in which the maximum temperatures were 103·4°, 103·2° and 102·6°; in the last case the temperature was 101·2° before injection, 101° at the 9th hour, 101·8° at the 12th hour, 102·4° at the 15th hour and 102·6° at the 18th hour. The positive reactions were all confirmed by the double intradermal test and *post-mortem* examination showed that the decision on the reaction to both tests was correct. I suggest that the subcutaneous test result was often wrongly assessed.

Another difficulty with the intradermal tests has been the question of the delayed reactor (the animal in which the injection site shows no departure from normal until after the 72nd hour, which is usually the time of the final observation). Delayed reactors are not so frequently encountered with Weybridge tuberculin but they are of frequent occurrence with avian tuberculin which is much less potent and it is very possible that the time of reaction is partly governed by the potency of the tuberculin employed. This is probably no new phenomenon: we can all recollect that with the subcutaneous test some cattle reacted at the early observations (it may be, sometimes, so early that the reaction was past before our first temperature record was taken), while others and particularly aged cows reacted at a later observation (it may be, sometimes, after we had made our final temperature record).

There is no need to elaborate: what I want to convey is that we are not up against new problems in the reading of reactions; such problems have always been there to be solved and it is safe to assert that the two particular difficulties mentioned have been solved to a great extent—in the first case by regarding anything which is a departure from normal as a positive or doubtful reaction and in the second case by the use of a more potent tuberculin where the number of late reactions is greatly reduced.

There is one difficulty peculiar to the double intradermal test. It has been criticised because it is not considered necessary to make a second injection. When it is remembered that the double intradermal method of testing was introduced when less potent tuberculin was generally used, considerable weight must be attached to this criticism, for the tuberculin now employed is much more potent and may be expected to produce reaction with a single injection.

Research is now in progress to find (1) the site of choice and (2) the accuracy as judged by *post-mortem* examination of the single intradermal test. If the single test is found to be accurate we will all no doubt welcome it as serving to reduce the labour and time taken in testing, and indeed the shorter time involved in testing may well be essential if eradication is to proceed and the number of herds under test is to multiply in consequence.

I would like now to consider the question of what produces a reaction to the tuberculin tests. This requires an answer if we are ever to understand this question thoroughly.

Tuberculin produces a reaction in an animal because of the state of allergy or sensitivity of the animal to this product, but this sensitivity may result from infection with a number of allied organisms; in other words, the allergy is a group allergy and a positive reaction means that the animal has become sensitised by one of the organisms of the group. If we appreciate that this is so we have come a long way towards an understanding of the position in regard to tuberculin testing.

Before proceeding further let us consider the question of potency and specificity of tuberculin. It has long been a cry that we must have a tuberculin sufficiently potent to produce a positive reaction in all bovine infected animals. Essentially this is not a difficult thing to do but unfortunately there are many animals infected with bovine tuberculosis which are not highly allergic and it requires a comparatively potent tuberculin to produce a positive reaction in such an animal. (Indeed there are probably animals infected with bovine tuberculosis which will not react to any tuberculin). Consequently, when we strive to find as near 100 per cent. of bovine infected animals as possible by stepping up the potency of the tuberculin it has been found that we obtain positive reactions in a very large number of animals not so infected—non-specific reactors—and therefore if we determine to remove as reactors only those animals which are infected with bovine tuberculosis, adjustment of potency of the tuberculin can never be the method of differentiating between animals which are actually infected with bovine tuberculosis and those which, though sensitive to tuberculin, are not so infected.

* Address to the meeting of the South Wales Division, N.V.M.A., held at Carmarthen, May 29th, 1942.

The only method open to us is to adopt comparative testing based on the specificity of tuberculins. In cattle all that can be said at present is that the allergic animal is more sensitive to the homologous tuberculin—the homologous tuberculin has a greater specificity: thus, a bovine infected animal should react more severely to a bovine tuberculin than to an avian tuberculin and an avian infected animal should react more severely to an avian tuberculin than to a bovine. And further, there is ground for suggesting the possibility that tuberculins from certain strains of a particular type of organism are more specific than others.

However, it is quite impracticable to carry out comparative tests with tuberculin produced from each of the organisms which will sensitise an animal and for all practical purposes a mammalian and an avian tuberculin are all that is required. This is supported by American work which classifies the organisms—human and bovine infection in one group for which human tuberculin is sufficiently specific, and avian infection, Johne's disease and skin tuberculosis for which avian tuberculin is sufficiently specific. Many of our cases of skin tuberculosis do not behave in such a way as to support this classification but it is possible that more than one organism is responsible for the lesion which we describe as skin tuberculosis. And so the comparative test as we know it, with mammalian and avian tuberculin, has been adopted.

Having dealt with what might be called the theoretical side of the position which led to the comparative test let us look at the practical side of the picture. How were the phenomena just mentioned reflected in the actual application of a more potent tuberculin for general use in tubercle-free herds as compared with the earlier products?

With the earlier tuberculins we were all familiar with two particular difficulties which were frequently seen and were probably explained in the majority of cases by non-specific infection—we all knew of reactors which later passed the test and may even have found their way back into tubercle-free herds. Also there was a very large number of doubtful reactors which clearly passed the retest. We are also familiar with the no-lesion reactor. In connection with no-lesion reactors I will quote from a paper presented in 1936, for it is surely more accurate to refer to this question as it was seen then. It was then suggested that the "possible explanations of the no-lesion reactor are (1) that the opinion on the result of the test was wrong, either through the test being improperly carried out or through faulty interpretation, (2) that the animal had not yet developed lesions of tuberculosis although in an allergic state, (3) that the state of the allergy had persisted although lesions had been healed and had disappeared, (4) that the reaction was non-specific, *e.g.*, to Johne's disease or avian tuberculosis, (5) that the *post-mortem* examination was not sufficiently extensive and thorough". There is no need to-day to quote the discussion on any of the suggestions except number four—that the reaction was not specific, *e.g.*, to Johne's disease or avian tuberculosis. "The fourth reason is probably the most important. There is no doubt that at certain stages of infection with Johne's bacillus and the avian bacillus the infected animal is in a state of allergy sufficient to produce reaction to bovine tuberculin. In a number of cases of avian tuberculosis infection from poultry has been suspected because of the nature of the reaction to bovine tuberculin and because avian tuberculin produced a stronger reaction than bovine. Only one case has been followed up to the *post-mortem* room and the causal organism studied and found to be the avian bacillus." The tests to which this animal was submitted are then recorded; summarised, they were:—

June ...	Synthetic tuberculin	+
A week later	Old tuberculin ...	+
Mid-Sept.	Synthetic tuberculin	—
October ...	" "	—
Late October	Avian tuberculin ...	+
November	Synthetic	—
	Old	—
	Johnin	—
	Avian	+

In this animal one lesion of tuberculosis was found in a mesenteric gland after prolonged search and it was confirmed that the avian type of organism was responsible for the infection, and then again I quote —"The evidence of one complete case is not sufficient upon which to base a statement that avian infection is of great importance in tubercle-free herds, but, from this evidence, and the number of animals which, while giving indefinite reactions to bovine tuberculin, give positive reactions to avian, it is suggested that avian infection is responsible for a small percentage of reactions in tubercle-free herds, and for a very large percentage of doubtful reactions." That was written in 1936.

There was a good deal more evidence to show that avian infection was responsible for reactions to this tuberculin; for instance, out of a small series of 20 reactors submitted to complete *post-mortem* examination at the Moredun Institute and sent from herds being dealt with under the A.H.S. Scotland from November, 1936, to January, 1938, five were shown conclusively to be infected with avian tuberculosis and two were probably so infected. It must be remembered that this evidence which confirms that some reactors to the earlier tuberculins were non-specific reactors, is based on a comparatively small number of *post-mortem* examinations. It is not, however, weakened by this: there has always been difficulty in obtaining *post-mortem* examination of cattle from tubercle-free herds except in some districts where their owners have insisted on *post-mortem* examination, and it is from such districts that most no-lesion reactors have been reported. When Weybridge tuberculin was being first tried in the field it was found that it was producing reactions in a number of animals which passed the test with the earlier tuberculin, but were affected with bovine tuberculosis, and as further trials appeared satisfactory it was eventually decided to introduce Weybridge tuberculin for use in connection with the Attested Herds Scheme.

First of all it was used, as you know, for first official tests and at this stage there was a somewhat higher number of reactors than had been previously found at such tests; when it was used in May, 1940, for general tests under the Attested Herds Scheme, the number of herds showing reactors and the number of reactors rose alarmingly and with accumulated evidence of *post-mortem* examination and results of retests it became plain that an alarming number of animals reacted because of non-specific infection. And so we come to the comparative test, about which, in conclusion, I wish to say a few words.

Under the Attested Herds Scheme herds which have never shown reactors are still tested with mammalian tuberculin only. There are still a large number (nearly half) of the Attested Herds in this category. What I want to say to you about such herds is to stress the great importance of marking as positive or doubtful reactors, any animals which show the slightest departure from the normal negative. It is not sufficient to believe that a very slight departure from normal in an animal in such a herd is bound to be caused by non-specific infection and to mark the reaction negative; in order to come to such a conclusion it is imperative that a comparative test should be done. It is far better to do the comparative test even in every herd in the country than to take such a risk as is implicit in such a cavalier decision as I have mentioned.

Attested herds which have previously had a comparative herd test or have had animals submitted to the comparative test are all tested by comparative test and so also are all T.T. herds.

There is no need to go into detail about the technique of the test but there are a few points which are particularly important. (It is hardly necessary to mention that the syringes and tuberculins must not be confused). So far as syringes and needles are concerned every one has his own preference and so long as the needle is fine and the point sharp and the syringe will deliver the required dose without serious variation it seems to me best for each operator to use the equipment with which he has become familiar. The calipers will also vary with the taste of the operator—and they are tremendously important. We have already said earlier that the yard stick for deciding upon reaction to the intradermal test is not particularly good; all the more reason why we should exhibit very great care in obtaining and recording measurements—and accurate measurements *can* be obtained with reasonable care. This is particularly true of the comparative test where the two swellings on an animal are measured by the same operator with no significant time-lag between the measuring, and I say that whatever type of caliper is used it is possible to get a consistent comparative measurement of the two swellings. Care should be taken also to record oedema or diffuseness accurately and above all consistently. In any test we must have a yard stick and in the comparative test it becomes much more important because while the test result for each infection site is recorded by the operator he is not responsible for the interpretation of the test.

Besides accurate recording there is another factor which may well nullify all efforts to obtain good results from this test. I refer to careless siting of injections. It has become more and more apparent that great attention must be paid to this question. Injections near the shoulder give less pronounced reactions than do injections nearer the head; the site of choice is the middle third of the neck. It was for this reason that it was requested that one injection should be made on each side of the neck; for practical reasons it was decided that two injections might be made on one side of the neck provided the sites were carefully chosen. It is difficult to describe the optimum siting for the comparative test on one side of the neck but it may be stated generally that the two injections must be sufficiently far apart so that if the reaction to either is pronounced the one reaction does not interfere with the other—about 5 inches. Each injection should be as near as possible equidistant from the shoulder and if this is

achieved the lower injection site will be somewhat further forward than the upper one. But if good siting has not been achieved and this is appreciated when the 48th hour observation is made, *record the fact.*

One other point—it is always better to clip a fairly large area of the skin so that the plaque-like reaction is not missed by being lost in the long hair around the injection site.

It is quite obvious that if the comparative test is to give reliable results we must use the tuberculins at potencies which are the same in each batch, with the mammalian and avian tuberculins so adjusted as to content of the active principle, as to give a result which can be interpreted with greatest certainty. In order that the comparative test may be rendered more efficient in the future research is also proceeding with this end in view and it is anticipated that the tuberculins which we will eventually use for it will be P.P.D. tuberculins, perhaps even bovine and avian P.P.D. tuberculin and not human and avian as at present.

With the comparative test as now carried out we may occasionally accept for retention an animal which is indeed infected with bovine tuberculosis, but in all the *post-mortem* examinations which we have done we have found only one case in which well-established disease was present in an animal which was accepted by the comparative test. All the others which had been accepted and showed bovine tuberculosis at *post mortem* had either failed to react to either tuberculin at a comparative test following a herd test in which mammalian tuberculin only was used, or they showed calcified or apparently encapsulated lesions or no lesions at all, but organisms of the bovine type were recovered from a group of lymph glands by biological test. On the other side there are still a few animals being removed from herds and bovine tuberculosis is not found at *post mortem*, but lesions of skin tuberculosis may be found or avian tuberculosis, as in one case in a very young calf. The percentage of reactors removed from attested herds in recent years has been—last three quarters 1938 : 0·63% ; 1939 : first quarter 0·64%, second 0·73%, third 0·44%, fourth 0·29% ; 1940 : first quarter 0·55%, second 2·28%, third 1·43%, fourth 0·57% ; 1941 : first quarter 0·53%, second 0·40%, third 0·47%, fourth 0·26% ; 1942 : first quarter 0·16%.

The numbers of cases dealt with under the Tuberculosis Order from Attested and T.T. herds in recent years have been :—

April 1st, 1938 to March 31st, 1939	...	53
April 1st, 1939 to March 31st, 1940	...	68
April 1st, 1940 to March 31st, 1941	...	47
April 1st, 1941 to March 31st, 1942	...	16 (four not affected)

I am going to suggest to you that even now, because we are using a potent tuberculin which will find as near as possible 100% bovine infection (and we will never get 100% results) eliminating non-specific reactions by the comparative test, we have come much closer to the true position with regard to bovine infection in tubercle-free herds than ever before.

DISCUSSION

Dr. W. R. WOOLDRIDGE (President, N.V.M.A.) : The address they had been privileged to hear from Mr. Ritchie well illustrated the value of co-operation between the practitioner and the Animal Health Division of the Ministry—this, together with the official note on the tuberculin test which had recently been published in *The Veterinary Record* as an explanation to the profession as to why changes had been effected in the test. The Animal Health Division had been honest in that report : they stated that there was much work still to be done before the tuberculin test could be regarded as perfect. It was true that this should have been said ten or more years ago, when changes would have been expected, and many of the difficulties of the Ministry and of the practitioners during the latter years would have been borne with greater goodwill and understanding. In the future it was hoped that the profession would be kept informed of impending changes. Consultation between the N.V.M.A. and the Animal Health Division was now very good and they hoped to see it improved still further : he, personally, had every hope that this would happen.

Mr. WATSON (President) thanked Mr. Ritchie for his constructive and destructive address : constructive in the knowledge that he had given them of the difficulties under which they had worked and destructive as far as the criticism they had prepared was concerned.

Mr. W. DAVIES : All felt very grateful to Mr. Ritchie for coming there and for giving them such an interesting address on a very important subject, especially in that part of the country where so much tuberculin testing had been done. As the President had already mentioned, he failed to see how they could well discuss the address : Mr. Ritchie had explained himself so clearly.

He was pleased to hear Mr. Ritchie say that, more or less, the only satisfactory test to-day was the comparative test and he was sure nearly all of them were of the same opinion. He had during the last two or three years, since Weybridge tuberculin came into use, tested hundreds of animals and he could not think of a single one which after passing the Weybridge test had shown bovine infection. They were at a slight disadvantage in that when they did a test of a herd and put down a few animals, they did not have the chance of following them up : they lost sight of the herd until it came back to normal again, and by that time in the majority of cases the cow in which they were interested had been sold.

Mr. PARRY : Going back two or three years, he would like to recall his experiences in the testing of Welsh Black cattle which were rather thick skinned. In the first test he had about nine reactors when tested with R.V.C. tuberculin and these passed on retest. In the second test he had 17 reactors, but not one of the original. Again these passed on retest. It was only in the thick-skinned animals that he had noticed this difficulty.

Mr. T. R. THOMAS : Personally, he thought after 20 years of playing with tuberculin, they were getting a product that could clear their herds of tuberculosis. In his view the subcutaneous test told them whether or not infection existed, and he had found that the Cambridge tuberculin did pick out reactors. The fault lay in themselves in that they expected too big a reaction before putting an animal down. It was his experience that herds tested with Cambridge tuberculin had stood the test of time, and were still clean.

He would have liked Mr. Ritchie to have mentioned something of the reaction in young calves. Sometimes they had reactors among young calves in a clean herd, a herd they visited frequently and the owner of which they knew—a very important point in cleaning a herd, because once they got the confidence and help of the owner the cleaning up of the herd was very easy, especially when the owner was prepared to do what you told him and to remove any doubtful reactors. These calves gave a big reaction, but he never found that they reacted again. Inspectors who came after them turned a herd down on finding a calf giving this big reaction, but those calves went into other herds and perhaps the same inspector would then pass them. He would also like more information about hard, circumscribed swellings. They had them with the Cambridge tuberculin and they got them with Weybridge. To what were they due ?

Mr. J. C. HILL : Many years ago the Ministry of Health had invited the veterinary surgeons of South Wales to a demonstration on tuberculin testing by Mr. Glover, of Cambridge, who tested a herd, and they were invited to see the test on the fourth day when Mr. Glover drew the attention of the veterinary surgeons to two animals, one of which in his judgment had passed, while the other had not. The measurements were identical and Mr. Glover left it at that. Practically everyone present then expressed different opinions but they never found out who was right.

When they were testing in tuberculin tested herds they were told to pay great attention to diffusion. Measurements did not count so much in those days : it was diffusion, pain and heat, whereas Mr. Ritchie had said he could never find heat. He thought the subcutaneous test was quite as reliable as the double intradermal, but the only test they could rely on to-day was the double intradermal comparative test.

Mr. A. D. J. BRENNAN : Referring to tuberculins and the different amounts of P.P.D., etc., he would just like to get it clear. Did this measuring of the protein in the tuberculin mean that every brew that was made was of the same potency ? How was it standardised ? There were many other questions he thought Mr. Ritchie could probably answer well from data in his possession. One of those was the question of the times of taking the readings. Could he tell them, for instance, if it was absolutely necessary to take readings at the 48th hour ? He probably had sufficient data to be able to answer that. He wondered also if there was any need to change the tuberculin at all from Weybridge to P.P.D. It seemed that in this district, at any rate, everyone admitted and everyone agreed that there had never been such a satisfactory state of affairs from theirs and the farmer's point of view.

Mr. J. C. HILL : His district was a milk-selling one, and there were a large number of cows coming into the district. They were either reactors or doubtfuls when he first tested them, and all from attested herds. He wondered if there was any possible explanation with regard to the sensitivity being disturbed by change of environment.

Mr. D. J. DAVIES : Following on Mr. Hill's last remark, he would rather agree that sometimes when they tested a herd, perhaps a clean herd, for years, and they had bought a new animal, it was the new one which gave a reaction although it came from a clean herd.

Mr. H. M. DUFF : With regard to homologous tuberculin, Mr. Ritchie had just told them that the mammalian tuberculin was actually derived from a human strain. Would it not be the case that they would obtain a better reaction if there was human infection in the herd, and that being so, animals were being needlessly disposed of ? Mr. Ritchie had said it was not necessary to emphasise the danger of mixing syringes, but it was a very easy thing to do in practice. In that connection he would like to mention also the point of having an efficient syringe. It often happened that the syringe leaked past the plunger and the animals did not have a sufficient dose.

Mr. T. H. JONES said he would first like to thank Dr. Wooldridge. He thought it was very nice of the President of the N.V.M.A. to visit the different branches. He thus acted as a liaison between the Divisions and the parent body and by this means created interest and enthusiasm. He hoped it would be possible for him to visit them again very soon.

With regard to Mr. Ritchie's address, he was sure that they were all very grateful to Mr. Ritchie for his interesting and instructive contribution. It was a great pity that this address was not delivered at the Society of Veterinary Practitioners in London some time ago. It was a pity, too, that the two articles on the tuberculin test by the Ministry of Agriculture, appearing in the May 16th issue of *The Veterinary Record*, were not known to that meeting. It was possible that had they known more about tuberculin and its application and the work done by the Agricultural Research Council and the Ministry, they would not accuse them of being such organised inactive bodies.

Although the Agricultural Research Council said that much more information was required before the tuberculin test could be placed on a fully satisfactory basis, he believed that there had been many great improvements in the manufacture of tuberculin and in the technique of tuberculin testing during the last few years He took strong exception to what most of the speakers said at the S.V.P. meeting. It made one think and wonder whether they in South Wales, where tuberculin testing was done on a bigger scale than anywhere else in this country, were testing just for the sake of lining their own pockets. It was really refreshing to read recently in *The Veterinary Record* the views of two veterinary surgeons in another part of the country expressing views which agreed entirely with their experiences in South Wales.

His only criticism of the Ministry was that they should have taken the profession more into their confidence and kept them informed of their findings much earlier than they had done. He agreed with practically all Mr. Ritchie had told them.

He thought, however, that until they got a bovine tuberculin that would give a reaction to bovine infection only, the comparative test should always be used, and he had a strong conviction that at present all tuberculin tests should be done by the comparative method.

There were many instances one could quote to verify this. He would very much like to know why the comparative test was regarded by some critics as being unscientific.

He believed that tuberculosis could be eradicated by the tuberculin test provided one got the full support and co-operation of the farmer. They had many instances in their practice where this had been done. Good use must be made of the scrubbing brush and the blow lamp.

He would also like Mr. Ritchie's opinion on whether he thought it was really necessary to take measurements at the 48th hour. He had yet to see a test where there was a positive reaction at the 48th hour, and a negative reaction at the 72nd hour. It did not really matter whether the measurements were 7-9-14 or 7-12-14, both were positive. He wondered, too, whether it was wise to make a hard-and-fast rule that where mammalian tuberculin alone was used and when there was no diffusion, a rise of 4 mm. should be termed doubtful and a rise of 5 mm. positive. He found that at least 95 per cent. of these non-diffuse swellings turned out to be non-specific.

Perhaps Mr. Ritchie would tell them, also, what acid-fast organisms, apart from avian tubercle, could cause non-specific reactions.

Mr. A. F. BUTLER was sure they had benefited from the presence of Mr. Ritchie and the President of the N.V.M.A. at the meeting. They knew that there was a great deal to be done and there was room for a great improvement in the tuberculin test as a whole and also in the tuberculin used, but it remained for them, the

veterinary profession, to do the best they could with the tools available at the present moment.

Mr. J. W. Simpson: With reference to P.P.D. tuberculin, he would like to know if the quantity (by weight) of the protein in the tuberculin represented actual specific protein or whether it was the total protein. If it was not all specific then the scale of measurement would not seem to be accurate.

Mr. F. V. John: Most of them had felt for a long time that it was high time the Ministry came into the open about their tuberculin. The necessity for all the secrecy was rather difficult to understand, because they all knew that the Cambridge tuberculin had given rise to misgivings, and that Weybridge on its own was far too strong, and now they had come to understand that the comparative test was practically almost entirely satisfactory. They did not get to know these things from being able to follow all their cows through to *post-mortem* examination, but by a knowledge of the herd from test to test, and by being able to follow certain cows through several tests. He thought it possible to assess the value of a tuberculin by these means together with an occasional *post-mortem* examination, with a high degree of accuracy.

He thought the only test worth considering was the double intradermal comparative test, and that the sooner the 'Veybridge double intradermal alone was abolished the better for all concerned. In his opinion, they must occasionally appear very silly to farmers, when they did a double intradermal using Weybridge alone. They finished testing and had several so-called reactors. They had to tell the owner that the animals were probably not tuberculous and that they would be retested in 30 days. In a month's time the farmer had to go to the trouble of getting his cattle in on four successive days and even though they passed at that test, he had the further trouble of a six-monthly test instead of a yearly. This meant to the farmer a lot of wasted time which in these days could be turned to much better account. This very unsatisfactory procedure could be avoided by the use of the comparative method at the initial test.

Why was the practitioner not allowed to retest the doubtful cows, or to retest the herd until it returned to normal? Surely the man to retest doubtfuls was the one who had done the initial test. This failure of the Ministry to allow the practitioner to follow his cases caused a lack of interest in the test. It was not enough to be notified of the result of such retest, the practitioner should be allowed to perform the retest.

All this suggested that the Ministry lacked confidence in the L.V.I., but they should realise that the practitioner had got them out of the very nasty position in which they found themselves after the issue of Weybridge tuberculin. Without the practitioner's careful handling of the situation in the field, the Attested Herd Scheme would have fallen through, and there would be no opportunity for the testing of further tuberculin. He thought the L.V.I. was entitled to be told more about the difficulties and suggested that before the issue of the new P.P.D. tuberculin, a supply should be issued to L.V.I.s in order that opinion in the field might be obtained.

The practitioner also encountered difficulty with regard to the testing of single animals. In his opinion, the only method that should be used was the comparative method. The usual findings were a small reaction to bovine and a much larger one to avian. The Ministry's instructions were that a retest should be carried out in this case, but in the field this was impossible for various reasons, and he wondered if the measurements could not be submitted to the Ministry for their opinion. He thought that it was wrong to state the measurements on the certificate, because the ordinary purchaser would not be expected to appreciate the significance of the large measurements and a certificate showing high measurements might be more harmful than no certificate at all.

Another point he would like to raise was with regard to the recent meeting of the Society of Veterinary Practitioners. He thought that if they had a grievance, it should be threshed out between the practitioner and the Ministry. It was thoroughly bad taste to have an outsider with an obvious axe to grind to do their tuberculin thumping. Some of the views expressed at that meeting were to say the least ludicrous, and were obviously from people who knew little or nothing about the actual position. It was significant that there was not one L.V.I. from South Wales present, and as that meeting had seen fit to put forward recommendations it was only fair to point out what little experience they were based on, and what little weight they could carry.

Mr. John concluded by saying that he thought the Ministry were well on the way to solving the problem of tuberculin testing; he thought they should know that they had the practitioner behind them in their efforts.

Mr. R. McNeil inquired which strain of the tubercle bacillus was to be used in the preparation of the new tuberculin, and how was the protein content to be standardised? One other point that was troubling him in testing was the application of the comparative test, using avian. He found that if he injected the tuberculin high up in the neck he got a bigger reaction than when he injected it lower down.

Mr. R. J. Thomas thought it worth mentioning in a meeting of that kind, that the passing of the Agriculture Act was a most important step in the progress of tuberculin testing. They were going the right way and the Ministry had opened up something they should have done long ago. In regard to the times of visits, he wondered if the 96th hour in the single intradermal comparative test could be dispensed with.

Mr. W. R. Cockrill: Most of them had spent such a lot of time testing that they thought they had become nearly expert at it, but in his view if they all spent longer on each individual animal a great deal of good would be gained.

Mr. Macgregor: Was there any possibility of manufacturing antisera which would agglutinate those non-specific proteins, and give a tuberculin which would react to the bovine organism only?

Mr. Watson, from the Chair, said that he had not taken any part in the discussion, and he thought all the questions he wanted to ask had now been put. Mr. Ritchie had given them some interesting figures at the end of his talk which, he thought, proved that the tuberculin had improved considerably. He wished again to thank Mr. Ritchie for his very lucid address and also to thank Dr. Wooldridge for taking such an active part in the meeting.

The Reply

Mr. Ritchie first dealt with Captain Davies' reference to the question of the L.V.I. being unable to follow up the test in a herd, saying that the Ministry does send a report of what has happened at a retest. Certainly the L.V.I. does not carry out the retest but he does learn the result of the retest. Mr. Parry's mention of those fairly large circumscribed reactions, seen particularly in Welsh Black cattle, had raised an extremely interesting point. He thought we must definitely realise that they did get some difference in the type of reaction in skins, depending on the type and quality of skin injected. The same difficulty was found in other breeds such as Herefords and Red Polls. In his view the comparative test had been of considerable value in such breeds in that a decision had not to be made on one swelling; if the apparent reaction was due to some peculiarity in the skin it would be seen in the sites of both injections and thus be possible to come to a more correct decision.

Mr. T. R. Thomas had encountered difficulty about young calves. They had had some difficulty with the comparative test in very young calves; indeed, in one case it has been shown at *post-mortem* examination that a young calf removed as a reactor after comparative test was infected with avian tuberculosis. One should be a little careful in removing a single calf from a herd and this was an instance where the history of a herd gave a great deal of help; for instance, a large number of reacting calves would cast suspicion on their supply of milk.

Mr. Hill had mentioned the question of potency and sensitivity. The method of assessing potency which was being used at the moment was, first of all, the estimation of the protein content of that tuberculin; but it was not necessarily correct to say that two batches of tuberculin containing "x" mg. of protein per c.c. were of the same potency. It was necessary to have a standard and to test the fresh batch of tuberculin against the standard to estimate the potency by biological test (or the relative activity of the tuberculin). It had also been suggested that there did not seem to be much point in using P.P.D. tuberculin. One of the factors was this, that it was possible to produce much larger batches of tuberculin at one time, and consequently a large supply of tuberculin could be standardised at one time. P.P.D. tuberculin stated to contain 1 mg. of P.P.D. per c.c. might not actually contain exactly 1 mg. per c.c., but the equivalent of 1 mg. per c.c. of the standard.

The question of sensitivity was very much in the realm of theory. There was very wide variation in the degree of sensitivity in an animal, depending on a whole lot of factors, including the type of infection, the activity of the disease, and perhaps also the virulence of the organism causing the infection.

Mr. Reynolds had stated that he had even better results from the caudal fold and vulva tests. His (Mr. Ritchie's) own experience in caudal fold testing was that it was not any better, but he must say that the caudal fold and vulva tests were useful as check tests.

Mr. Davies' opinion was that we should test only with the double intradermal comparative test and go on to the herd tests right away. At the moment about half the attested herds were tested with mammalian tuberculin only. If they ever had any reactors these were tested by comparative test along with controls and all subsequent herd tests were by the comparative method. It was still considered worth while to test those herds which had never shown reactors by mammalian tuberculin only, in view of the time saved. Mr. Hill had also mentioned reacting animals purchased into herds. The speaker thought that had been put incorrectly. There might be farmers who, having been told their herd has passed the test, thought that it was advisable to sell those animals which showed reactions even though the comparative test indicated that the infection was not of bovine origin, and this might be the explanation of the position as Mr. Hill had found it.

The question of the times of observation in this test had been raised. They had records which showed that, rarely, an infected animal might show reaction at the 24th hour and none later: also records showing that with avian tuberculin no reaction was seen before the 168th hour. Thus, if they were to be absolutely accurate, observations would require to be made from 24th to 168th hour. This was obviously impracticable and in practice, taking everything into account, the 48th and 72nd hours were the times at which observations were most satisfactory.

He entirely agreed with Mr. Duff's remarks concerning the efficient syringe, but it must be appreciated that it was difficult at the moment to get syringes. His statement that he did not think it necessary to emphasise the possibility of mixing syringes and tuberculins was his method of emphasising the point.

On the question of specificity, it might be shown eventually that better results were obtained with bovine tuberculin, but there was not, at the moment, any real proof that anything more specific was obtained with a bovine tuberculin than with human.

Mr. Jones had criticised the meeting at which the Society of Veterinary Practitioners discussed tuberculin testing, and he thought there was a considerable amount in what he said; it was remarkable that the general support for the comparative test should come from the areas where most testing was carried out.

The same speaker had wondered why they stated that an increase of 4 mm. should be called doubtful and an increase of 5 mm. positive, in the test using mammalian tuberculin only. His experience was that about 95 per cent. of such reactions were non-specific. The position was really this, that they did know that a percentage of such reactions was caused by bovine infection and they also believed that they would never disclose as reactors 100 per cent. of animals infected with bovine tuberculosis. They must try to approach the 100 per cent. mark as nearly as possible and consequently they could not possibly ignore the fact that some of those small reactions arose from bovine infection.

Another question asked was, What are the acid-fast organisms other than avian tubercle which sensitise the animal? He thought he could say quite definitely that Johne's bacillus was one. There was an organism found occasionally in the skin lesions which was acid-fast, to a degree at any rate, and animals with skin lesions certainly reacted. They suspected actinomyces and there might be others. Other infections had also been suspected; at all events, it was quite clear that infection with avian tubercle bacilli was not the only one which caused a non-specific reaction.

Mr. John asked what they did with skin lesion cases. If they got a record of skin lesions clinically in an animal which, according to this test, would be removed from the herd, they retested it, but the retest of such animals was not usually so satisfactory as with, for instance, avian infection. Another question was whether a lesion could be removed and, if so, would the animal fail to react afterwards? They had no direct evidence that this was so, but they had been informed by one or two veterinary surgeons that they had removed lesions and that the animal had ceased to react: some, of course, ceased to react although the lesion remained.

The Continental workers who had done the comparative test had suggested that the best method of retesting was to reduce the dose of tuberculin and that was just what they were trying to do by giving a single instead of a double injection when they retested animals following a herd test by the comparative method.

Mr. Thomas had mentioned the question of dispensing with the 96th hour observations in the single intradermal comparative test. There was no question that there were many cases when the 96th hour observation was of no value at all, but there were a number of occasions when the 96th hour observation did provide a result which did away with a further retest, particularly where there was a late reaction to avian tuberculin.

Weekly Wisdom

". . . *There is a little Crustacean known as Sacculina which begins life as a hearty, active little free-swimming creature; but idleness affects it, and Nature takes away from it all that makes life worth living—legs, eyes, brain, stomach, all disappear—and a degenerate, wretched, apparently lifeless sac is all that remains. Now Nature is not quite so drastic as this with lazy students; one sometimes thinks it might be a good thing if they were attacked in a slight degree in certain organs—their imbibing organs, for example —yet in the struggle of competition they are pulled up sharp by the examination, and taught that idleness does not pay, and though much study may be a weariness to the flesh a proper amount of study is certainly most desirable and essential if a man wishes to succeed in his profession. . . .*"—Professor Bottomley, Inaugural Address, Royal Veterinary College, London, 1902.

THE VETERINARY RECORD

October 3rd, 1942

LAND, INDUSTRY AND AGRICULTURE

THERE is a growing realisation that the economic, social and cultural life of the nation is ultimately dependent on the right use of the land. During the inter-war period agriculture was declining and rural institutions were decaying. A Government Committee, under the chairmanship of Mr. Justice Scott, was appointed to study the problems involved and some of its main conclusions have already been given in a preliminary notice.[1] The committee was chiefly concerned with the factors that should govern the entry of industry into rural areas and the means of promoting the wellbeing of rural communities and the preservation of rural amenities. It was not directly concerned with agriculture *per se*.

In order to grasp the problem it is necessary to realise that Great Britain is the most urbanised country in the world. The population of the towns is about seven times that of the villages and countryside combined; on the other hand, the area of agricultural is eight times that of "developed" land.

The Committee feels that after the war, without effective planning, the present disorderly spread of the large towns into the country will continue at an increased rate. In the past the best agricultural land has often been taken for building or other purposes because it is level and well drained and therefore cheaper to "develop." The Committee believes that these tendencies must be checked and that no good agricultural land should be taken for development until the possibility of using other sites has been carefully considered. It believes that unless the economic status of workers in town and country, and the possibilities for advancement, can be equalised the introduction of industry into the country must be harmful. It sees great difficulties in the formation of any link between industry and agriculture[2] and advocates the redevelopment of derelict areas and the controlled introduction of light industries into the country towns, but is opposed to the entry of industries into country areas. The Committee puts forward numerous suggestions for revitalising rural life and improving rural amenities with which all will agree. The first amongst these is the improvement of rural housing, the deplorable conditions of which, in many areas, have been one of the causes of the drift from the land. The womenfolk have naturally influenced this drift. As one writer put it: "reduced to terms of flesh and blood and the sentiments that go therewith, our agricultural policy must start from the house which caught the eye of Mary, when she was making up her mind whether she should marry William, who drives the tractor."

In order to carry out its plans the Committee advocates the setting up of a Central Planning Commission with a full-time independent chairman, which would continually investigate problems as they arose. There would also be a non-departmental Minister of Planning to co-ordinate the work of other departments. The Uthwatt Committee, which has also been studying problems of post-war development, particularly in relation to land valuation, reached much the same conclusion.[3] It "recommends the immediate vesting in the State of the rights of development in all land lying outside built-up areas (subject to certain exceptions) on payment of fair compensation." It has carefully considered the vexed problem of land valuation and its recommendations would abolish the speculative value of the land for building purposes. This in itself would be a great benefit to agriculture, for in the past land has been bought for its possible future development value and then allowed to go derelict.

The Scott Committee assumes that after the war it will be part of the Government's policy to maintain a prosperous agriculture. And indeed, as farmers' profits have been strictly controlled in this war the moral responsibility of the industrial to the farming community will be much greater after this war than after the last. Differences will arise, however, over the type of prosperous agriculture that is to be maintained. The Committee believes that "a healthy and well balanced" agriculture will depend on "the continuance and revival of the traditional mixed British farming."

The Committee was obviously motivated by the highest ideals but we feel that it had too strong an attachment to the traditional aspect of the countryside, which it rightly says is dependent on the type of farming practised. In a minority report Professor Denison also criticises the broad definition of agricultural policy outlined by the majority. His views can perhaps be summarised by a quotation which he gives from the book by Astor and Rowntree.[4] "The aims of our agricultural policy should be to promote a happy marriage between nutrition and agriculture rather than to shut out overseas competition, to improve the conditions of the agricultural labourers rather than to increase their numbers, to treat agriculture as an industry or group of industries, possessing peculiar features indeed, but existing for the purpose of satisfying human wants with the minimum of toil, rather than as a way of life to be preserved with the minimum of change." We would agree with this statement and it expresses the views of most students of agricultural affairs.[4] Like all other industries agriculture cannot be maintained, it must be encouraged to develop. Lord Ernlee, in his book on the history of agriculture, has shown how the attempt to maintain a peasant agriculture on the Continent has led to a lower standard of living for the agricultural worker than his counterpart in this country. "While a policy aimed at producing as cheaply as possible those foodstuffs most required by the nation would indeed mean changes in the character of agriculture, and a smaller number of workers, it could create a prosperous agriculture and provide standards for the worker which would make isolation as unnecessary as it is undesirable." What is destroyed by change is often not physical beauty, which may or may not be increased, but mental associations.

Despite its advantages there is a danger that planning may induce the State to maintain outworn methods or institutions. The Scott Committee was not directly concerned with agriculture. We feel that a Government committee to consider the best means of developing the type of post-war agriculture most advantageous to the community, and therefore the most prosperous, would complete the work so well begun by the Scott and Uthwatt Committees.

The Committee draws special attention to the fundamental importance of adequately trained architects and town planners and it is clear that there is a growing insistence on the importance of education in all fields of activity. The Conservative sub-committee on education said: "the State must learn to treat education as its biggest long-term job," and that "there will have to be a far stronger understanding of its importance than has yet come about either in Parliament or in the country at large."

A strong sense of moral purpose is essential to sustain a nation in war. The Committee say: "It is our firm belief that a vital incentive to the war effort is the presentation of a clear picture of a better world which lies ahead and which, if plans are drawn up and the essential preparations made in advance, can be achieved after this struggle is over. To delay planning and the legislation to carry the plans into effect until the time for action is upon us—the end of the war—we believe to be a fatal error. As a nation we may have a genius for extemporisation, but our great failures, both in war and in peace, have been due to a failure to think ahead and to make plans in advance."

The great majority of the people will now expect the Government to introduce legislative action to implement these reports—it would dispel any lingering doubts which they may have concerning the Government's post-war policy and would give a fresh impetus to the war effort.

(1) *Vet. Rec.* 54. 356.
(2) There is, however, a close association between industry and agriculture in Belgium. See discussion on European agriculture "The Advancement of Science." 11. 134.
(3) Cmd. 6386, Stationery Office. 2s. 6d.
(4) *Vet. Rec.* 54. 91. See also pages 252, 270 and 302.

CLINICAL COMMUNICATION

Brucellosis in Yearling Filly

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The subject of this note was a yearling Shire filly. Her mother had suffered from fistulous withers some four years previously but made a good recovery after being operated on. Blood from the dam was positive to the agglutination test.

July 5th, 1941.—On this date the filly was noticed to be ailing. Respirations were very rapid, there was great depression and lack of appetite. She was seen by one of my assistants, who found she had a temperature of 106°, with lungs congested and marked lameness on the near hind leg. Suspecting pus in the foot, a careful search was made without result—100 c.c. prontosil was administered.

July 7th, 1941.—The temperature was 105°. I saw the filly myself—respirations were still accelerated and the lameness marked. A swelling over the sesamoid region had now appeared, and I ventured the opinion that *Br. abortus* was probably the cause of the trouble. A blood test was made and a positive reaction obtained. A further injection of prontosil 100 c.c. was given and a plasmul poultice applied to the fetlock region with instructions to renew every twelve hours. She was now eating a little bran and oats.

July 9th.—The respirations had become normal; the temperature was still much above normal. Sulphanilamide in 1 oz. doses night and morning was prescribed. The lameness was still very marked and the hock had now commenced to swell. The filly was now showing great loss of condition.

July 15th.—An injection of 5 c.c. avirulent living abortion vaccine was administered. There was a very pronounced swelling at the seat of injection, and some constitutional disturbance following the injection.

The filly was now turned out to grass after a light blister had been applied to the fetlock, which was still very enlarged.

Progress was maintained and eventually the fetlock and hock regained the normal.

January 8th, 1942.—I was called to see her again, and found that she had a running wound on the chest midway between the elbow and last rib on the near side. A probe went in about four inches upwards and forwards. The pus was thick but did not show many organisms on microscopical examination. There were a few diplococci to be seen.

The wound was syringed out night and morning with a solution of formalin and caustic potash. It never stopped running completely and a large amount of new tissue was put down around the orifice of the wound.

February 14th.—After an injection of local anaesthetic all the tissue was dissected out from under the skin and two sinuses opened up to the end—no necrotic tissue or bone being found. The wound was packed with Bipp and stitched up. The skin wound healed well but still the small wound that was left continued to discharge.

February 26th.—I probed it again and found a sinus about five inches long, extending downwards and forwards. This I packed with a strip of bandage soaked in 1:1,000 acriflavine and instructed the owner to change it once daily. An injection 5 c.c. of Av. Abortion vaccine was given.

In three days all discharge had ceased, the wound healed and up to May 6th it had not broken out again. All trace of the lesion disappeared under the new hair that was grown.

The owner attributes the cure to the last injection of vaccine, but, of course, it may have been the treatment by the acriflavine that completed the cure. I may say that abortion is practically always present on this particular farm in a mild form.

TUBERCULOSIS IN FARMERS' CHILDREN

Dr. Bruno Lange, leading German authority on human tuberculosis, speaking at a meeting of the Berlin Veterinary Society in December, 1941, said, in regard to tuberculosis in farmers' families, that the established idea that tuberculosis in children was almost entirely due to the drinking of infected milk was no longer tenable. Recent work on 13 children who had died of tuberculous meningitis showed that in only six was the infection alimentary. In two it was primarily pulmonary (without doubt) and in the other five cases it was evidently aerogenous also. Lange explains this by the practice of mothers to take their young children into the cow byre, so that they can keep an eye on them while they milk the cows, the children thus inhaling infected dust.

ANNOTATION

The Control of Bovine Tuberculosis in Germany

It is probable that in veterinary circles Germany is supposed to have lagged behind other countries inside and outside Europe in this matter, which is at present of great topical interest. It is interesting, therefore, to note that proposals for a new plan of campaign have been made in Germany, whereby it is expected that the way will be opened for progress at last to be made.

It is well known that hitherto Germany has used the Ostertag method for the control of bovine tuberculosis, which von Ostertag, when head of the veterinary service to the Prussian Government, introduced after finding out by a limited but probably adequate trial that Bang's system was unworkable. This fact should not be forgotten. He devised another way, which he thought would be practical and economical while catering for public health interests. He planned to detect and remove open cases of tuberculosis in cows by clinical examination followed by the bacteriological examination of excretions from the body openings and of the milk of animals suspected to be affected with open tuberculosis. This was, however, by no means the whole of his method, but only part of stage I. The rest of stage I was this—"education of the farmer into the nature, recognition and control of tuberculosis." The other two stages were planned to operate progressively as stage I made progress. Stage II was—"removal of older animals with open tuberculosis and raising of tubercle-free calves." Stage III was—"tuberculin testing of such calves and the building of a fresh herd with them." Thus it will be seen that the complete method was commendably comprehensive and farsighted and quite commensurate with its great author. It had, however, one serious defect, which the researches of Nieberle have exposed comparatively recently. Ostertag believed, on the basis of the pathological knowledge of the time (1905-1912), that the detection of open cases would result in tuberculosis dying out in a herd, as the source of new infection would presumably be removed quickly enough. We now know that an animal can become infected with progressive and potentially open tuberculosis both exogenously (from another animal) and endogenously (by reinfection from a primary lesion in its own body). The detection and removal of open cases by annual examinations can never eliminate tuberculosis: this was conclusively proved by a large-scale test carried out by the Prussian Government, starting in 1933. All herds in a large area comprising 1,000 cattle were examined by the so-called intensive modification of Ostertag's method of examination, differing from the ordinary method in that every animal was examined bacteriologically instead of only the suspected ones. This resulted in the finding of many times more open cases. The experiment continued for about four years and each herd was examined annually, all open cases being removed and no new beasts admitted. At the first test 20 per cent. open cases were found: a year later 15 per cent. and the next year 15·3 per cent. Thus it was proved that this method could not eliminate tuberculosis.

The Ostertag method was voluntary and was introduced in 1912, but never became widely used. Thus, in 1936 only 518,000 herds out of about 3½ million in Germany were enrolled and even in them stage III was hardly approached and stage II was not fully in operation. The reasons for this can be summed up by "economically unfavourable conditions." Incidentally, one may here wonder why the Third Reich régime did not make the scheme more fully effective: perhaps military reasons prevailed—why, indeed, go to great trouble when the same means can be got by conquest? Booty cattle from Holland and Denmark have, since 1939, been distributed into German herds enabling tuberculin reactors to be eliminated.

The position of bovine tuberculosis in Germany just before the war of 1939 was as follows: the cattle population was roughly 22 millions. About one million cases of tuberculosis were observed at abattoirs every year and an additional 46,000 cases were detected under Ostertag's scheme. The total annual loss from tuberculosis has been computed at 250—350 million marks. As to the infection rate in German herds—in 1937 a tuberculin test survey was carried out on about 412,000 cattle in 50,000 herds and the reactor percentage was 31. This is probably about correct for the Reich as a whole and is indeed accepted by German veterinary writers in recent papers.

It is at this juncture that Muessemeier, head of the veterinary department of the Reichgesundheitsamt (Ministry of Health) announced at the end of 1941 new draft proposals for State control, which would operate in two stages—(1) the seeking and preservation of tubercle-free herds (compulsory) and (2) the disinfection of infected herds (at first voluntary, but later perhaps compulsory). Part I would begin to deal with all herds in which tuberculosis was not known or suspected to be rife during the previous three

years. The intradermal tuberculin test would be universally used as a criterion of infection. Tubercle-free herds when once recognised would be so kept by enforced enactment, which is set out under eight directions dealing with (1) identification of beasts, (2) addition only of tubercle-free stock, (3) safeguards for calves' milk supply, (4) use of tuberculin test, and of clinical and bacteriological examinations, (5) disinfection of premises after detection and removal of cases of tuberculosis, (6) compensation for reactors found free of tuberculosis at *post-mortem* inspection, (7) compensation for cows in milk removed on account of tuberculosis, (8) prohibition of presence of tuberculous persons at tubercle-free farms. Inducements or rewards for maintaining tubercle-free herds would comprise a premium of two pfennigs per litre of milk sold and small grants towards the cost of building improvements.

Regulations for part II of the scheme are set out in 16 directions, which will be passed over here to save space: suffice it to say that the method envisaged is similar to that of Bang—the creation of fresh clean calf herds, while the infected herd gradually dies off. The tuberculin test would of course be used here also.

Before discussing this scheme we will digress to consider another method which has been in use since 1938, namely control under the Rindergesundheitsdienst (RGD) or Cattle Health Service, which was introduced by the Ministry of Nutrition and Agriculture and is operated by the provincial Tiergesundheitsämter or Animal Health Offices, which have been in existence for many years. These embody animal disease diagnosis, investigation and control services and also do much public health work. The RGD in three provinces (Pomerania, Rhineland and East Prussia) have to date started tuberculosis control work and one of them (Rhineland) has reported experiences with it. Area eradication has been the goal, this actually meaning dairy district areas, in which one dairy handles milk from every farm in its particular area. Three dairy districts were selected and two years' work have resulted in substantial progress (Eickmann). A premium of 0·7—1 pfennig per litre has been granted under this scheme, but it is not considered to be sufficient and will probably be increased.

To return to the Müssemeier proposals, two directors of Animal Health Offices have published critical articles (Weisgerber and Eickmann). The former calculates that the present supply of veterinarians, farm workers and others is ridiculously inadequate for the very heavy tuberculin testing programme which part I would necessitate. The financial resources of the livestock insurance companies would also be far too small. Both writers also criticise the scheme piecemeal and comment unfavourably on its bureaucratic nature.

Commentary on certain aspects of control, with special reference to German opinion

1. The State's part: It is by now fairly universally admitted that voluntary effort is unsatisfactory. The State must play a leading part and must either compel or induce the farmer's co-operation. Obviously the latter is far preferable and probably indispensable. The education of the farmer at the outset is of paramount importance: Ostertag was wise enough to see this and the Americans learned it in the early stages of their great campaign. What is particularly necessary is to organise tuberculin tests followed by autopsies for farmers in order to show them that skin reaction swellings really are true indicators of tuberculosis within (preferably) a healthy-looking beast. Mere abstract talks on the tuberculin test are useless. Adequate financial backing is another necessity, which increases inversely as the degree to which the farming industry is kept depressed.

2. Technical personnel: It was agreed in German veterinary circles that the Ostertag method was applied much more effectively by whole-time workers. Control in the RGD system is entirely whole-time specialist work and due allowance is made for the staff to spend an appreciable part of their time in extension work, as the Americans call it. In this connection small village gatherings are much more efficacious than large ones.

3. Diagnosis: The three methods—clinical, bacteriological and allergic—are all important and the first two should not be neglected. Clinical diagnosis has been developed especially in Denmark and Sweden and bacteriological diagnosis in Germany. The Germans have come late into the field of tuberculin testing and still use old tuberculin, although they now apply it intradermally like the rest of the world. The problem of the doubtful reactor is only now beginning to engage their attention.

4. Segregation: Goetze found that tuberculosis could spread across an exceptionally large and wide byre from an infected to an uninfected row of cattle. It seems that this can happen in a roofed building of almost any size. It follows, therefore, that if existing buildings are to be partitioned, it is necessary to do it completely from roof to floor. If separate quarters are to be provided it is sufficient that the new building should be a temporary affair, because if all goes well the new calf herd would be able to succeed to the permanent buildings in about three years' time, after the original herd has been got rid of.

5. Immunisation. It appears to be the current German opinion that there is no hope of immunising animals against tuberculosis. Dr. Bruno Lange, an authority on human tuberculosis, recently declared himself in that sense. B C G appears to stand discredited in Germany and is rarely mentioned now in veterinary papers. At present our vole strain alone appears to have fresh possibilities. It may happen, however, that salvation from tuberculosis will be obtained from the chemotherapeutical direction, as a new drug named "Promin" has been reported from America to open new fields of promise.

6. Control of farm personnel. The new German proposals prohibit tuberculous persons from having contact with tubercle-free herds. No country is known to the writer to have legislation to this effect, but it is obviously extremely important. Cases have been observed in Denmark in which a clean herd was disastrously infected by a man with bovine type open tuberculosis and cases where fresh reactions have occurred in a clean herd owing to infection with human type tubercle bacilli are by now quite plentiful. The Danish veterinary authorities tried but failed to have a law passed to deal with this menace. Time was and perhaps still is when doctors advised tuberculous people to adopt country life (= farm life). That this should be stopped goes without saying. Much is said and written about the menace to man of bovine tuberculosis, but the converse is important to us veterinarians and should be kept in mind and put in the mind of medical men.

J. E.

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Lange, B. (1940.) *Beitr. klin. Tuberk.* **43**. 381.

PARS FROM A BROADCAST*

The really important cow diseases, from your point of view, as people who depend on milk as food, are mastitis, contagious abortion and sterility. It is estimated that through these three diseases the amount of milk that could be produced is down by 198 million gallons a year. The diseases have caused so many losses to cattle that the National Veterinary Medical Association, the Ministry of Agriculture and the National Farmers' Union devised a panel scheme for controlling them. At the moment the scheme is voluntary. A contract is made between the farmer and his own veterinary surgeon.

. . . . . .

Then I'm called in to advise on dietetics; what should Fido eat in war-time? Is that coloured meat from the Pet-Shop all right? Well, yes, it probably is. More important, the farmer asks is silage really worth making? What about growing linseed? Is oat-straw harmful to animals? What about this new pulping of wheat-straw, a process of rendering insoluble fibre into a digestible mass? I must find an answer to these and many similar questions. I'm really expected to be a bit of a farmer myself.

. . . . . .

When we operate to-day, we use anaesthetics probably more than doctors do.

. . . . . .

My friends envy me driving about this beautiful country in nice weather, but forget that I'm often out at night on urgent cases in all weathers. Snow, sleet, rain, muddy lanes, dirty farmyards, gumboots and mackintosh. An interesting, but arduous life. It's more than likely that, when I get home to-night, there's another case awaiting me.

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Control over the acquisition and disposal of motor vehicles has been extended to include the disposal of vehicles which are being replaced under licence by new vehicles. Under an Order which comes into force immediately, the replaced vehicles must be disposed of according to the directions of the Minister of War Transport. The new vehicle may not be used until this has been done.

* Given on the Home Service programme by a veterinarian practising "in a small town in the mid-west."

REVIEW

[THE PASTEURISATION OF MILK. By G. S. Wilson, M.D., F.R.C.P., D.P.H. Published by Edward Arnold & Co., Price 18s. net.]

The publication of this volume, treating the question of pasteurisation of milk from every aspect, fills a long-standing want in the literature upon this most controversial of subjects. Not only will the book prove invaluable to members of the medical profession, but it will also have a strong appeal to the veterinary profession and to dairy farmers as well as to the consumer.

The available data upon such questions as the nutritive value of milk, infection of raw milk with pathogenic bacteria, milk-borne diseases in the human population and the methods of rendering milk safe including that of pasteurisation are presented, generally speaking, in a well-balanced and objective way.

The author has rightly been outspoken on the question of safety as may be instanced by the following quotation: "not until safe milk is made generally available, will the medical profession be able unreservedly to recommend its use." Few can quarrel either with that statement or with the various ways in which it is paraphrased in the text. There can be no doubt that pasteurisation offers the only available means at the present for ensuring that the bulk of the milk consumed by the public is safe. Not only is it essential to rid milk of pathogenic bacteria derived from the cow, but it is also necessary to prevent danger from disease-producing germs of human origin that gain access to the milk subsequent to its leaving the farm.

It is perhaps unfortunate that the author has not brought out as clearly as one might wish the fact that a policy for the elimination of diseases from dairy cattle is equally essential as a collateral policy. The realistic acknowledgment of this fact by eminent medical men would do much to allay the old controversy that pasteurisation will arrest improvement in the system of milk production. The leaders of thought in the medical, veterinary and agricultural worlds should make quite certain that they work together for an improvement in the quality and quantity of milk consumed by the public, an aim which needs a united effort directed at improvement at all stages in the preparation of this valuable food from the beginning of production until ultimate consumption. For this reason we regret that Professor Wilson has seen fit to stress unduly his own view that progress in the improvement of methods of the control of the diseases of dairy stock is bound to be very slow—we are of the opinion that a bold policy of disease control on the farm would produce valuable results in a much shorter time than the author of this work appears to think possible.

Apart from this observation we heartily recommend the book to all our readers as a valuable contribution upon this all-important question of safe milk supply. It should certainly be read by veterinarians, farmers, medical men, members of the public and especially by Members of Parliament.

MORE THAN 15,000 SLAUGHTERHOUSES CLOSED

Delegates of the Northern Market Authorities' Association and of the Midland and Southern Market Authorities' Association recently stated a case to the Ministry of Food for financial relief in respect of the abattoirs in which they are interested. It was pointed out that control had severely curtailed the activities of many abattoirs, on many of which considerable expenditure had been incurred as they were regarded as part of the Public Health Service, and, as such, they were not run for profits. No local authority should have to bear increased losses by reason of control.

On behalf of the Ministry, it was replied that local authorities had been given much greater consideration than private owners. Of the 16,000 slaughterhouses in use at the outbreak of war, 660 were in use now. Ninety-seven per cent. of the privately-owned slaughterhouses had been closed. Against this, of the 224 owned by the local authorities 220 remained, representing a percentage of 90 per cent. in use, whilst the figure for private slaughterhouses was 3 per cent. The Ministry's agreement with all local authorities whose slaughterhouses had been selected for use under the control scheme was based on the principle that the Ministry paid tolls or rents, as the case might be, at pre-war rates in respect of pre-war services. As a greater proportion of the total stock slaughtered was now dealt with in public slaughterhouses, compared with the pre-war years, the local authorities, in consequence, received in the aggregate a larger income. The Ministry would find it difficult to justify an increase in the rates of tolls, or payments in respect of rent, or guarantee the owners against any loss, especially as no compensation was payable to owners of those slaughterhouses which were not being used.

The Ministry of Food has agreed to *ex gratia* payments to the Corporation of Liverpool and Bradford with respect to their abattoirs.—*Meat Trades Journal.*

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Oct. 7th.—Meeting of the Scottish Metropolitan Division, N.V.M.A., at Edinburgh, 10.45 a.m.
Oct. 9th.—Meeting of the Lancashire Division, N.V.M.A., at Manchester, 2.15 p.m.
Oct. 13th.—R.C.V.S. Council and Committee Meetings, Royal Station Hotel, York.
Oct. 14th.—R.C.V.S. Council and Committee Meetings, Royal Station Hotel, York.
Oct. 16th.—Meeting of the Mid-West Division, N.V.M.A., at Bath, 3 p.m.
Oct. 24th.—First Annual General Meeting of the Society of Women Veterinary Surgeons, Friends' House, Euston Road, N.W.1, 2.30 p.m.

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N.V.M.A. Annual Meeting and Conference

A Memorable Gathering

The events of last week, arranged in association with the annual general meeting, were a source of refreshment to all who participated in them: most of all must the officers of the N.V.M.A., all of whom were re-elected for a further term, have felt the inspiration of their vitality. Pending the publication, in an early issue, of an extended account of the proceedings, some outstanding impressions of the gathering may be recorded.

A splendid start was made on the evening of Wednesday, September 23rd, when over 200 "National" enthusiasts and well-wishers attended the reception given by the President and Mrs. Wooldridge at the Waldorf Hotel. On the following day the Council Room of the Holborn Restaurant was filled for the first part of the annual general meeting. Here, following the welcome to a large number of official delegates and representatives, Dr. Wooldridge, in a brilliant and boldly conceived presidential address, propounded his views on the organisation of an efficient service to minister to the welfare of all animals and to secure an improvement in the quantity, quality and safety of human foodstuffs of animal origin. As readers of this address will be made aware in due course, far-sighted proposals were also put forward to meet the requirements of veterinary education, practice and research. The President concluded his review of a nationally conducted health service by advocating the establishment of an "animal health corporation," with governors appointed by the State and with a veterinary surgeon as its chief executive officer. Major policy would be decided by the Government, but the corporation would have almost complete freedom in the direction of its execution.

The meeting then stood adjourned pending the completion of the remainder of the programme, which embodied the conference and the annual luncheon. On its resumption, the annual general meeting enthusiastically intimated its desire to retain the services of Dr. Wooldridge as President, Mr. Steele-Bodger and Mr. Hancock as Vice-Presidents (the latter is President-Elect), Mr. Bywater as Hon. Treasurer, and Capt. Wragg as Hon. Secretary. The renewed confidence thus reposed in Dr. Wooldridge by his colleagues constitutes a notable tribute to his energy, ability and high ideals for the profession. It was clear that uppermost in the minds of members in re-electing him was a sense of indebtedness for the way in which he has discharged the onerous duties which, with no regard for the personal sacrifice involved, he has so conscientiously carried out, coupled with an appreciation of the worth of those services, particularly in respect of fostering old and valued contacts and making new ones for the benefit of the Association. On all sides tribute was paid to the way in which, in a period of office notable for the official adoption of the "Survey Scheme," Dr. Wooldridge has led the Association with dignity and enhanced its status in every quarter.

A further particularly pleasing feature of the meeting was the award of the Dalrymple-Champneys Cup and Medal (for published work of outstanding merit in scientific research, clinical investigation of public health activity) to Mr. T. M. Doyle. Mr. Doyle,

alike in India, in Egypt and at the Ministry's laboratories at New Haw since their establishment, has rendered outstandingly fruitful service in the fields of pathology and bacteriological research.

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Many circumstances contributed to the importance of this year's annual luncheon. In the midst of much desolation the Mansion House stands four square—the embodiment of the Empire's solidarity—at the hub of the Empire, and the assembly of 350 guests and members, with their ladies, was deeply conscious of the significance, particularly at such a time, of the N.V.M.A. being accorded the high honour of holding its chief social function there, in the presence of the Lord Mayor and Lady Mayoress and with a host of other distinguished guests, including the Premier Duke of the Realm and the Minister of Agriculture.

Mr. Hudson, in proposing the toast of the profession, with concise eloquence traced the trend of veterinary thought and practice away from the " cat and dog complex " of pre-war days to the devotion of maximum energy to the vital task of maintaining a healthy livestock population. The cattle diseases control scheme was but one feature of a co-operative attempt by the profession, the agricultural community and his Ministry to meet the new conditions created by the war. The confidence of farmers could only be won if they were assured that the veterinary practitioners were sufficient in numbers and adequately equipped with the latest knowledge to carry out their heavy and exacting task.

The Minister's concluding reference to the need for the provision of adequate veterinary educational facilities furnished a prelude to the momentous announcement made by the President, in the course of an impressive reply, to the formation of a national trust to raise and administer funds to finance the better education of veterinary surgeons. Full reference to this pronouncement is made in the note which follows this series.

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The contributions to what may be termed a " United Nations " Veterinary Conference—so valuable was the part played by representatives of most of the Allied Governments—were uniformly constructive in dealing with the subjects for discussion; " Inspection and Control of Meat and Milk " and " Preventive Medicine on the Farm." The opening papers and the report of the discussions will be published in these columns in due course. The initial address in the discussion was given, with a delightful spice of trans-Atlantic humour, by Colonel E. M. Curley, Chief Veterinarian, U.S.A., Veterinary Division, European Theatre of Operations—followed, as to meat, by Major Brennan DeVine, Mr. H. R. Tinney and Mr. J. Campbell Hill; and as to milk by Capt. Blood, Veterinary Officer in charge of this service in the United States Air Force, Mr. H. E. Bywater and Mr. S. J. Edwards. The subject of " Preventive Medicine on the Farm " was introduced by Dr. Tj Bakker, representing the Netherlands Government, followed by Mr. Steele-Bodger and Dr. R. Lovell.

Many points of great moment to the public health of the nation, particularly at this time, were made by the speakers, and the fact that their criticisms and proposals in regard to what were referred to as " those vital munitions of war," meat and milk, have been accorded wide publicity in the Press, as were many other features of the whole meeting, in itself affords proof of the wisdom of the officers of the Association in seeking, by means of this conference, to turn the statutory annual meeting of members to good account.

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The Veterinary Educational Trust

As intimated above, Dr. W. R. Wooldridge, President of the N.V.M.A., announced at the Mansion House luncheon on September 25th, that a Veterinary Educational Trust has been established to raise and administer funds to finance the better education of veterinary surgeons. The minimum sum required is £1,000,000 and this will be administered by a Council composed of members connected with all branches of science and agriculture. In the course of a statement the Trustees say that, in general, the aim will be to assist with the development of veterinary education more broadly than is likely to be achieved by direct Government assistance to the colleges. There will be two main avenues of approach. The Council will be a position to provide scholarships to enable deserving students to become veterinary surgeons, and fellowships and studentships so that those who have graduated may pursue courses of advanced study or undertake research either at home or abroad. Equally, grants may be made to enable graduates aspiring to become veterinary teachers to put in the necessary post-graduate research, and to assist veterinary surgeons in general practice to take refresher courses. On the other hand, every effort will be made to improve the standard of teaching at veterinary schools, and increase their liaison with the Universities.

With this objective the Council may allocate money to assist improvement in staff arrangements or the purchase of special equipment, particularly in those instances where it is desirable to encourage the development of a new branch of veterinary study or teaching. Stress will be laid on the importance of securing teachers enough time and also opportunities for study or research, and financial assistance may be granted to enable senior members of the staff to take study leave in order to visit allied institutions at home or abroad. Grants from the Trust fund may also be made with the object of improving facilities available for the teaching of veterinary students, particularly in connection with farm animals. Provision is also made for the allocation of grants to student bodies in order that their unions may be able to participate fully in local, national and international student life, thus encouraging the development of future leaders of the profession.

Following are the names of the Trustees, and of the Council of Management:—

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The Right Hon. Lord Stamp, B.CH., M.A., M.B., Reader in Bacteriology, British Post Graduate Medical School, University of London.

The offices of the Trust are situated at 10, Little College Street, City of Westminster.

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" An Ally of Agriculture "

On the day succeeding the foregoing intimation of the formation of the Trust, *The Times* lent the powerful aid of its support, in the following convincing leading article, under the above heading:—

On many occasions since the last war attention has been drawn in these columns to the strange anomaly that, while breeding and exporting some of the best livestock in the world, Great Britain has lagged far behind other countries in the matter of equipment for the

study and teaching of veterinary science. As long ago as 1929 a departmental committee appointed by the Minister of Agriculture strongly criticised the condition of the Royal Veterinary College. In the following year Lord Harewood raised the question in the House of Lords. Eventually a royal charter was granted constituting a new governing body, and in 1937 the present buildings of the College (replacing those that had been in use since 1791) were opened by the King and Queen. All this showed distinct, though slow progress; yet it was not enough. Another Government committee, reporting in 1938, declared that "veterinary education has been starved, the veterinary schools are overcrowded, teaching staffs are inadequate . . . facilities for clinical and practical training are insufficient, and the system of education and courses of study also need amendment." These were strong criticisms, which the committee supplemented with valuable suggestions. One of these suggestions was that each veterinary school should have its field station, and in some of them—the Liverpool Veterinary College, for example—this has now been achieved. Obviously, however, there can be no complacency over a state of affairs which has lately drawn from such an authority as Sir Arthur Olver the accusation that "there is no other country in which livestock has such tremendous importance or in which so little has been done for veterinary education. . . . The necessary facilities are still not available in this country for adequate practical instruction."

With these facts in mind it is possible to appreciate the full importance of the announcement made by the President of the National Veterinary Medical Association yesterday that a veterinary educational trust has been formed with the object of improving veterinary education in this country and in the hope of raising for that purpose a fund of at least a million pounds. The sum is large, but it will give the nation an idea of the importance of the issues at stake. There are in this country, as Dr. Wooldridge has reminded us, only 2,000 active veterinary surgeons to cope with a task that could well employ twice that number. Britain's inadequate educational services, moreover, have the responsibility of providing veterinary surgeons for the Colonial Empire. The war has shown up some deficiencies here, as in other places. Animal health is an essential part of the economy of husbandry. Animal diseases must mean loss and waste and may, in some forms, have their effect upon public health. The revival of British agriculture on a permanent basis will demand all the aid that science can give and, not least, all that an improved and developing system of veterinary science can contribute in the way of prevention as well as of cure. More veterinary surgeons and a better training are needed, and a million pounds is by no means too large an endowment to demand for these purposes.

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Admission of Women to the Ministry's Veterinary Inspectorate

Many of our readers will have noted with interest the announcement in our last issue inviting applications "from either sex" for appointment by the Ministry of Agriculture and Fisheries as Veterinary Inspectors. The fact that these appointments are for the first time open to women and, more particularly, that they are being admitted to the service on the same salary scale as men—which is somewhat contrary to the general practice of the Civil Service—will be warmly welcomed by our profession as evidence of official recognition that our women graduates must be allowed to play the part in the sphere of veterinary preventive medicine to which their equal training and status entitle them.

This progressive step is one upon which congratulations are due not only to those whose rightful place in this sphere has thus been acknowledged by authority, but to the Ministry itself. More especially is this so because, as we are given to understand, the successful women applicants will be admitted, in principle, for the performance of general duties. In other words, their activities will not be confined to those special duties—for example, work in the poultry section—to which they might have been restricted by a Ministry less appreciative of the value of the comprehensive service our women graduates are qualified to render.

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PERSONAL

Marriages.—Berger—Stewart.—At St. Phillip's Church, Alderley Edge, on September 19th, 1942, by the Rev. W. J. Gravell, John Berger, M.R.C.V.S., youngest son of Mr. and Mrs. Harry Berger, formerly of Sydenham, to Leslie Mary, younger daughter of Sir Kenneth and Lady Stewart, of Alderley Edge, Cheshire.

Pembrey—Baxter.—On September 5th, 1942, at Lechlade, Herbert Guy Pembrey, M.R.C.V.S., youngest son of the late Prof. M. S. Pembrey, M.D., F.R.S., and Mrs. Pembrey, of Ramsden, Oxon, to Kathleen Ada Baxter, M.R.C.V.S., daughter of the late Mr. J. R. Baxter, M.R.C.V.S., and Mrs. Baxter, of Lechlade, Glos.

Millar—McCoskrie.—At Kirkmabreck Parish Church on September 23rd, 1942, by the Rev. C. V. A. Macechern, M.A., James Millar, M.R.C.V.S., youngest son of Mr. and Mrs. Millar, Carseminnoch, Newton Stewart, to Isabel, only daughter of the late James McCoskrie, Ohio, U.S.A., and of Mrs. McCoskrie, 1, Grimshawe Terrace, Creetown.

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We are glad to learn that Colonel Percy Simpson, of Maidenhead, a past President of the N.V.M.A., who has been seriously indisposed for some considerable time, is now enjoying greatly improved health, and that his condition is no longer a cause of anxiety.

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ROYAL ARMY VETERINARY CORPS

The following announcement is made in the issue of *The London Gazette* dated September 15th, 1942: Derek Peter William Lake (241323) to be Lt. August 14th, 1942.

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REFRESHER TUITION IN BOVINE PREGNANCY DIAGNOSIS, ETC.

Mr. H. W. Steele-Bodger, M.R.C.V.S., of Tamworth, will visit Ayrshire in the second fortnight in October, to give refresher tuition in bovine pregnancy diagnosis and treatment for infertility.

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R.C.V.S. OBITUARY

Webb, James, 82, Clarence Road, Windsor. Graduated London, April 26th, 1870; Fellow, December 11th, 1897. Died September 25th, 1942; aged 92 years.

Mr. James Webb, F.R.C.V.S.

The "Father of the Profession"

We announce above with deep regret the death of Mr. James Webb, who became the "Father of the Profession" on the death, last year, of Dr. Wm. Patterson, of Montreal. During the year, having been in practice for 71 years, Mr. Webb, whose pride it was that he had neither taken a holiday nor had a day's illness, announced his retirement as a practitioner, but after a few weeks he was in harness again. He it was who added "the wit to avoid turning night into day" to the rules for the attainment of a vigorous old age. Still upright and agile at 91, he rode a bicycle until he became a nonagenarian and preferred this to the car which he learned to drive at 74.

Mr. Webb, who was an esteemed member of the Central Veterinary Society and, of course, one of exceptionally long standing, was born at Epping, Essex, in 1851. When he obtained his diploma he was only 19, and was then the youngest member of his profession. He went to Windsor in 1906, and held several public veterinary appointments for many years. He was the holder of an officer's commission in the army, signed by Queen Victoria.

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H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

	Price net s. d.	*Post free* s. d.
Agriculture and Fisheries, Ministry of:		
Advisory Leaflet 275. Stomach Worms in Sheep (Parasitic Gastritis).	0 1	0 2
Dozen	0 9	0 11
Home Security, Ministry of, and Health, Ministry of:		
Air Raid Precautions Handbook 4A. Decontamination of Clothing, including Anti-Gas Clothing and Equipment, from Persistent Gases. 2nd Edition	0 3	0 4

* * * * *

THE HORSE FAIR, 1942

If you want to feel you are living again in the days of 30 or more years ago, take a look at one of the 1942 horse fairs. There hasn't been such a demand for horseflesh since motor cars first chugged the roads. You almost expect to find the gipsy horse-dealer there

with corduroy coat and jacket, a felt hat with the brim turned down all round, clay pipe and a long whip under his arm, trailing behind him a long string of piebalds and skewbalds! If things go on as they are, that type may well be resurrected. At Lee Gap, one of the West Yorkshire horse fairs, there was a huge demand, I am told. Ponies from the Welsh hills which, three years ago would have changed hands at five or ten pounds—if they sold at all—were snapped up at up to £40 each, and harness horses were worth at least twice their pre-war value. One or two other horse fairs have been written off as failures, not for want of buyers—but for want of horses to buy! All sorts of museum pieces in the way of horse conveyances are being brought into use again. It's a far cry back to those days of more leisurely travel. Of course, it's just a passing phase brought about by petrol rationing, but there are many who'd like to think it was a permanent sort of revival.—*Farmers' Weekly.*

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SCHEME FOR THE CONTROL OF DISEASES OF DAIRY CATTLE

STATEMENT SHOWING THE NUMBER OF UNDERTAKINGS NOTIFIED TO THE MINISTRY OF AGRICULTURE DURING THE WEEK ENDED SEPTEMBER 26TH, 1942

County	Undertakings Notified		Total Undertakings		
	During Week	Previously	Number	Number of Cattle	
				Cows	Heifers
ENGLAND					
Bedford	—	24	24	637	426
Berks	4	34	38	1,271	891
Bucks	1	27	28	745	539
Cambridge	—	9	9	185	92
Chester	9	207	216	7,690	2,527
Cornwall	—	—	—	—	—
Cumberland	—	20	20	623	574
Derby	9	93	102	3,136	1,880
Devon	—	73	73	1,267	817
Dorset	3	25	28	915	611
Durham	3	127	130	3,036	812
Essex	4	113	117	4,980	2,863
Gloucester	—	44	44	1,527	861
Hampshire	6	154	160	5,047	3,146
Hereford	—	13	13	228	111
Hertford	—	38	38	1,240	811
Hunts	—	5	5	148	92
Isle of Ely	—	1	1	1	8
Isle of Wight	—	4	4	55	15
Kent	2	59	61	1,231	757
Lancs.	7	93	100	2,943	816
Leics	1	34	35	982	647
Lincs (Holland)	—	4	4	45	11
Lincs (Kesteven)	2	9	11	120	78
Lincs (Lindsay)	3	29	32	586	244
Middlesex	1	4	5	259	122
Norfolk	2	110	112	3,335	2,216
Northants	2	37	39	1,080	881
Northumberland	—	38	38	1,225	608
Notts	6	44	50	1,235	620
Oxford	1	17	18	469	586
Rutland	—	6	6	110	68
Salop	5	135	140	4,597	2,082
Soke of Peterborough	—	—	—	—	—
Somerset	—	68	68	1,837	746
Staffs	2	95	97	2,941	1,482
Suffolk, East	3	42	45	1,107	767
Suffolk, West	1	23	24	464	328
Surrey	2	56	58	1,642	754
Sussex, East	3	86	89	2,405	1,261
Sussex, West	—	59	59	1,751	1,112
Warwick	1	71	72	1,897	1,207
Westmorland	1	13	14	292	333
Wilts	6	34	40	1,770	1,015
Worcester	2	100	102	2,249	1,079
Yorks, E.R.	3	29	32	626	298
Yorks, N.R.	2	57	59	1,268	679
Yorks, W.R.	12	125	137	3,583	1,259
WALES					
Anglesey	1	10	11	196	65
Brecon	—	2	2	25	9
Caernarvon	3	77	80	1,416	695
Cardigan	—	12	12	170	119
Carmarthen	3	133	136	2,565	1,340
Denbigh	4	33	37	771	372
Flint	5	61	66	1,459	697
Glamorgan	3	44	47	740	278
Merioneth	—	7	7	81	72
Monmouth	—	17	17	459	265
Montgomery	2	4	6	154	129
Pembroke	3	57	60	1,169	728
Radnor	—	—	—	—	—
TOTALS	133	2,945	3,078	83,985	43,901

Note.—Of the total 3,078 undertakings notified to date 820 are for 1 year, 176 are for 2 years, and 2,082 are for 3 years.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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STUTTGART DISEASE

Sir,—For the last four years I have been working on the various aspects of nephritis, mainly in the dog. It soon became evident that "Stuttgart disease" fell within the scope of this investigation and a review of the literature shows that the greatest possible confusion exists in this connection. Up to the present only a limited amount of material has been available for examination, and although I am not at present able to clarify the position, certain important points are worth emphasising.

To those interested the first striking point is the bewildering complexity of the nomenclature. The terms "Stuttgart disease," haemorrhagic gastro-enteritis, black tongue, avitaminosis B, dog typhus, acute and chronic nephritis with the consequent uraemia, etc., are grouped together by different authors in a variety of combinations as being synonymous. The basis for this grouping is found in the clinical symptoms, since, in the above conditions (and in many others), there is a common syndrome (inappetence, vomition (frequently haemorrhagic) and prostration), which in certain cases makes differential diagnosis very difficult or impossible in the absence of laboratory facilities.

A study of the records of routine autopsies shows that there is a substantial number of cases brought in for examination *in extremis* and from the history a tentative diagnosis of "Stuttgart disease" is made. The *post-mortem* findings vary enormously. Commonly there is a severe chronic nephritis; obstruction of the gastro-intestinal tract by foreign bodies, volvulus, intussusception, tumours, etc., are seen. Peritonitis, pleurisy, traumatic shock, severe and widespread infections of all sorts are also causal.

One of the first points which must be clarified is nomenclature. This needs to be rationalised and standardised when the whole group of conditions have been scientifically investigated in sufficient numbers. When this is done, the clinician, realising the possibilities, will be better able to arrive at essential features neglecting common symptomatology. At the present state of our knowledge it is possible to suggest certain modifications.

The term "Stuttgart disease" should either be confined to leptospiral infection or dropped entirely. The former alternative is to be desired as it was, in all probability, to this condition that the term was originally applied. The incidence of positive agglutinating titres to leptospira in dogs is much more frequent than is realised. Other features not widely recognised are that jaundice is relatively infrequent, and that nephritis is a not uncommon accompaniment. It is usually possible to give a definite diagnosis of this condition from blood and urine examination.

Acute haemorrhagic gastro-enteritis is a term which should cease to have any disease specific meaning, as it merely defines a major symptom common to a large variety of conditions. The fact is well known to those conversant with the literature on experimental shock in the dog, in which animal it has been shown that when the shock (defined as a circulatory deficiency neither cardiac nor vasomotor in origin, characterised by decreased blood volume, decreased cardiac output (reduced volume flow) and increased concentration of the blood (Moon)), is sufficiently severe, typical acute haemorrhagic gastro-enteritis is found as one of the most obvious parts of the syndrome. The following are among the known causal factors: anaphylactic shock, burns, uraemia resulting from nephritis, icterus, meat and chemical poisoning, intestinal obstruction, visceral ruptures and perforation, peritonitis, acute pancreatitis and various acute severe infections.

The term black tongue should not be used in a specific sense. This gangrene of the tongue resulting from circulatory upset, generally of a more prolonged nature, is most commonly found in chronic uraemia, although it is seen in some of the other conditions mentioned. In avitaminosis B, gangrenous glossitis is seen and seems to be considered as almost pathognomonic, although certain workers have been unable to reproduce the tongue lesions in dogs by feeding B deficient diets. The term dog typhus is generally used as being synonymous with acute haemorrhagic gastro-enteritis; further investigation is necessary and until something definite is discovered the term should not be used. Uraemia, resulting either from acute or chronic nephritis, is usually easy to diagnose with the use of the usual clinical urine examination. Many of the other conditions giving rise to the shock syndrome are more or less readily diagnosed and do not present much difficulty to the practitioner.

In summing up it can be said that the existing knowledge with regard to the "shock syndrome" explains the marked similarity of the symptoms in many diseases which may or may not be closely allied. It is obvious that every endeavour must be made to find the *fons et origo* in each case of the "shock syndrome." This entails collaboration of the practitioner and the laboratory worker. Detailed clinical examination, bearing in mind all the possibilities, and making full use of laboratory aids, is essential. In fatal cases adequate autopsies must be performed and in doubtful cases specimens should be sent to a suitably equipped laboratory for further examination. The main burden of differential diagnosis, as always, must rest with the clinician, and it is up to him, when provided with a definite diagnosis from the laboratory, to correlate his clinical findings with a view to separating the essential and specific features from the non-essential or common symptoms.

I would be very glad to outline the necessary procedures, and to carry out the laboratory investigations for those practitioners who are interested in this vexed question, and who are desirous of "setting our house in order."

I am,
Yours faithfully,
DAVID M'FARLANE.

Royal (Dick) Veterinary College,
Edinburgh, 9.
September 23rd, 1942.

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POST-MORTEM RECORDS

Sir,—With reference to Mr. Worden's letter appearing in *The Veterinary Record* of September 19th, I may say that I have been, for some time, engaged in analysing the records of my laboratory for the past 29 years, with a view to the provision of data of the sort indicated by Mr. Worden.

With regard to the diseases of fowls, several articles have already appeared, *e.g.*, in the Proceedings of the World's Poultry Congresses for 1927, 1930 and 1933: the last article gives references to other papers published by us.

I am, Sir,
Your obedient Servant,
D. C. MATHESON.

Department of Pathology, Bacteriology
and Meat Inspection,
Royal (Dick) Veterinary College,
Edinburgh, 9.
September 22nd, 1942.

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SCHEME FOR THE CONTROL OF DISEASES OF DAIRY CATTLE

Sir,—There is a splash of comedy in the letter of Mr. G. S. Allen published in *The Veterinary Record* of September 26th, for he appears not to know what happened at the meeting which he attended. I assume that he refers to the Exeter meeting held on August 5th.

There was at that meeting no vote against the scheme. A resolution was adopted, and it was framed by Mr. Smythe in consultation with the President of the N.V.M.A. The resolution was as follows: "That a statement of facts acceptable to the Survey Committee and to Divisions should be issued to farmers who wish to join the scheme, bringing home to them that the diseases cannot be completely eliminated by the application of the scheme, but that they can be reduced and controlled in some measure." Subject to this, the Division agreed not to refuse to operate the scheme.

As a matter of fact, the Division never did make a final decision not to operate the scheme, but it has struggled to have a clear understanding which will prevent farmers from assuming that better results than can be obtained are likely to result from it. I shall not return to this point. If anyone is in doubt reference can be made to the published minutes of the Division.

The reference to Mr. Smythe having fears based on economic grounds is as grotesque as it is ungenerous. Anyone who has knowledge of the concentration of cattle in the area covered by Mr. Smythe's practice and of the type of herd in it, knows also that farming the scheme in such an area could be a lucrative business.

Yours faithfully,
S. J. MOTTON,
Hon. Secretary, Western Counties Division, N.V.M.A.

Penzance.
September 27th, 1942.

"SUMMER" MASTITIS

Sir,—I have recently attended a series of cases of "Summer" mastitis in dry cows, none of which has responded to treatment. I have been "called in" when there was inflammation of one quarter from which could be stripped, with difficulty, a greenish-yellow pus of a consistency rather thicker than that of cream.

Frequent stripping (after fomentation and massage with emollients), combined with acridine infusions and/or sulphanilamide administration, has proved of little value, the quarter becoming more and more indurated, until infusion of fluids and stripping were impossible.

On the other hand, some cases have shown signs of septicaemia, which have subsided with a course of sulphanilamide in large doses, no effect on the local condition being noticed. This suggests that the septicaemia was caused by an organism other than that causing the mastitis—unless this was of a mixed infection.

Would other members kindly submit their experiences with curative and preventive treatment of this disease; the use of toxoids, autogenous vaccines, surgical interference, etc.?

Yours sincerely,
W. R. CHESTER.

St. Eloy's,
Farley Road,
Malvern Link.
September 26th, 1942.

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CARE OF FOODSTUFFS: COMBATING THE WEEVIL

Sir,—The depredations of weevils are the concern of us all, and with the difficulty of obtaining carbon bisulphide control is difficult.

Petrol applied by pouring on to whole grain in an airtight container, or even into a good sack, at the rate of one pint per 25 cubic feet will *kill* all weevils in 48 hours. Germination is not affected; the smell does not linger long in a warm climate; and on cooking there is no taste of petrol and the fumes do not seem to be particularly inflammable.

Yours faithfully,
EDWARD F. PECK,
Veterinary and Agricultural Officer, Somaliland.

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As Mr. Rowntree has pointed out recently in his social survey of York, the presence of children is the greatest cause of poverty—a crying scandal to our present civilisation and social order.—*Gavin B. Henderson.*

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV)

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
Aug. 16th to 31st, 1942	16	144	—	5	18
Corresponding period in—					
1941 ...	7	—	1	2	29
1940 ...	28	—	—	2	256
1939 ...	20	19	—	2	133
Total Jan. 1st to Aug 31, 1942	226	347	26	123	298
Corresponding period in—					
1941 ...	309	258	15	144	910
1940 ...	367	24	15	126	3,020
1939 ...	547	63	31	166	1,581

NOTE.—The figures for the current year are approximate only.
*Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at 31st August, 1942, was as follows:—

England	Wales	Scotland	Total (Great Britain)
3,915	8,973	3,380	16,268